

NOTICE

All drawings located at the end of the document.



**SURFACE WATER SOURCE
EVALUATION FOR RFCA
WATER-QUALITY EXCEEDANCES
IN WALNUT CREEK BASIN**



RECEIVED
RECORDS CENTER

SUMMARY

The Rocky Flats Cleanup Agreement (RFCA) requires reporting of "exceedances in Segment 5" and when "standards are exceeded at a Point of Compliance (POC)" and that a "source evaluation and mitigating action will be required". Specifically, this source evaluation addresses the August 15, 1997 Site report of elevated 30-day moving averages for plutonium (Pu) and americium (Am) water-quality results in Walnut Creek.

- These elevated values were measured at the POC monitoring location at Walnut Creek and Indiana Street (referred to as GS03) for the period June 12 through July 2, 1997.
- Elevated values were also measured at the Point of Evaluation (POE) monitoring location above Pond B-1 (referred to as GS10) for the periods April 13 through April 24, 1997, May 25 through June 20, 1997, August 2 through September 3, 1997, and September 22 through October 17, 1997.
- Finally, elevated values were observed at the POE monitoring location above Pond A-1 (referred to as SW093) for the period August 2, 1997 through August 3, 1997.

Source Evaluation documents have been delivered to the Colorado Department of Public Health and the Environment (CDPHE), the Environmental Protection Agency (EPA), the City of Broomfield and the City of Westminster.

The Site considers the recent elevated water-quality measurements at Site POCs and POEs serious in nature. Elevated values such as these have not previously been measured at GS03. The Site maintains open communication with regulators, cities, and stakeholders to relay the progress of the investigation. The Site has initiated a surface-water source investigation incorporating a variety of on-Site and off-Site expertise, as well as state-of-the-art research methods and technologies. The Site has initiated extensive data evaluations, additional field investigations (soil, sediment, and water analyses), and assessments of Site activities and monitoring programs. Activities and administrative changes have been implemented as quickly as practicable to determine the cause of these elevated measurements and continue to protect water quality. The Walnut Creek source location activities undertaken by the Site thus far, indicate that the GS03 exceedance is the result of legacy contamination. The source evaluation has uncovered no information that indicates that recent Site activities are responsible.

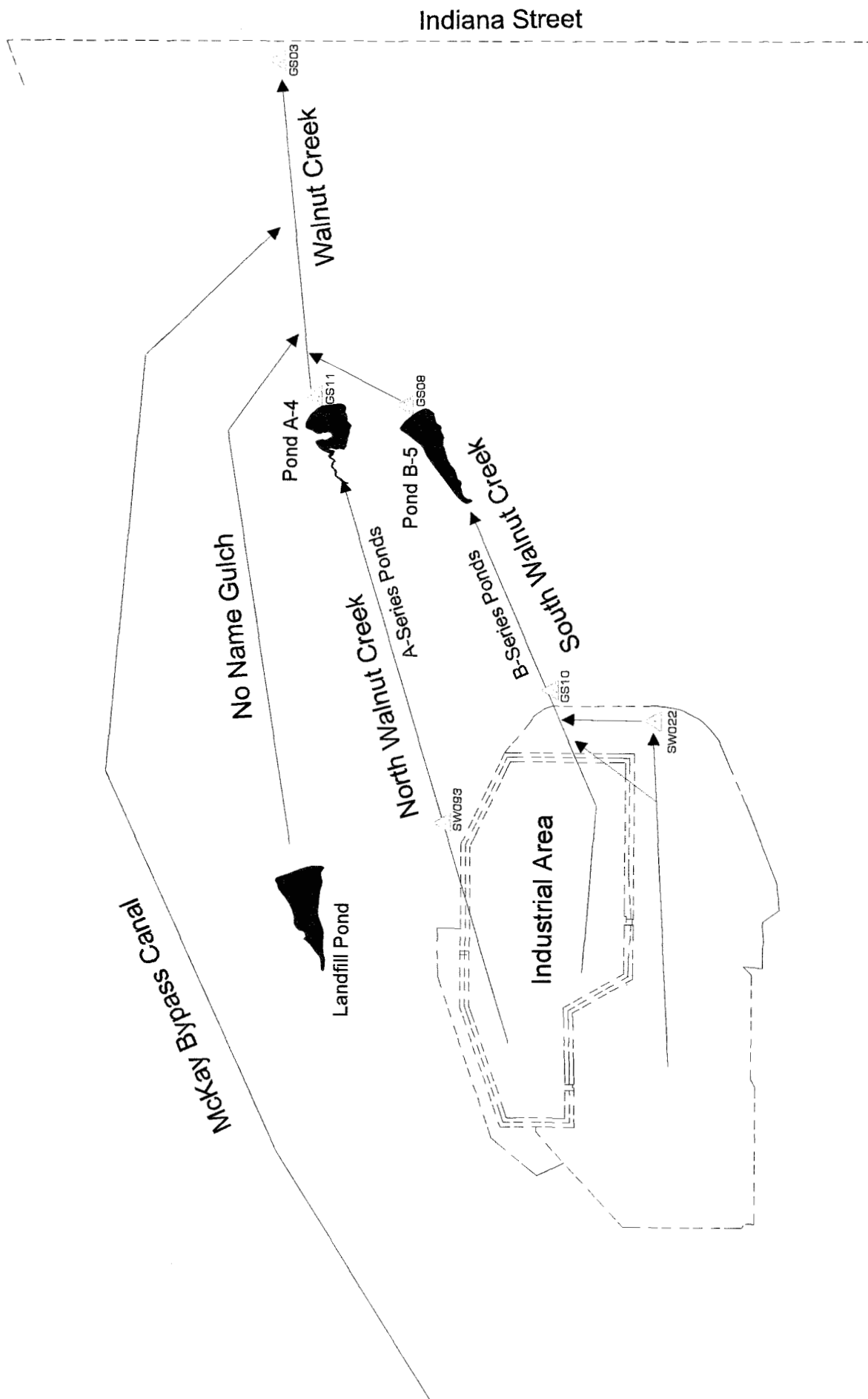
In order to allow sufficient time for effective source evaluation while simultaneously providing the more frequent dissemination of information and results as they become available, a series of three Source Evaluation Progress Reports have been completed, and a *Final Source Evaluation and Mitigating Action Plan* will be completed by April 15, 1998. The Progress

Reports have been produced at intervals during the source evaluation process as specific actions are completed. Data collection schedules are often weather dependent (collection of runoff samples) and subject to laboratory analysis turnaround times. The scope of additional collection is flexible and should be expected to change based on the knowledge gained during the source evaluation activities.

Deliverable	Completion Date
Source Evaluation Progress Report # 1	September 30, 1997; Completed
Source Evaluation Progress Report # 2	November 17, 1997; Completed
Source Evaluation Progress Report # 3	December 31, 1997; Completed
<i>Final Source Evaluation Report and Mitigating Action Plan</i>	April 15, 1998

Site Hydrology

Hydrologic Routing Diagram And Selected Monitoring Locations For Walnut Creek

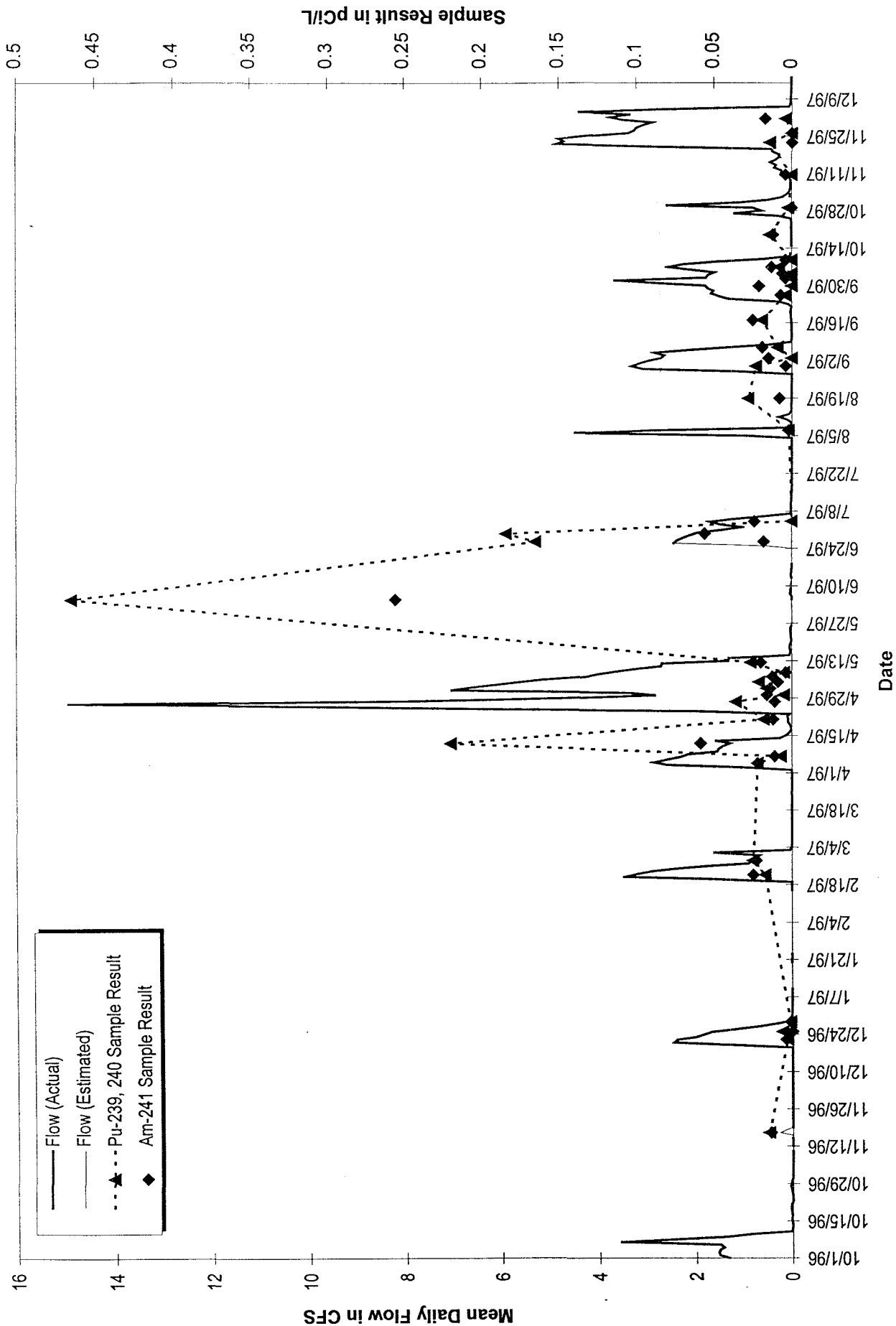


**Point of Compliance
Monitoring Results
(GS03)**

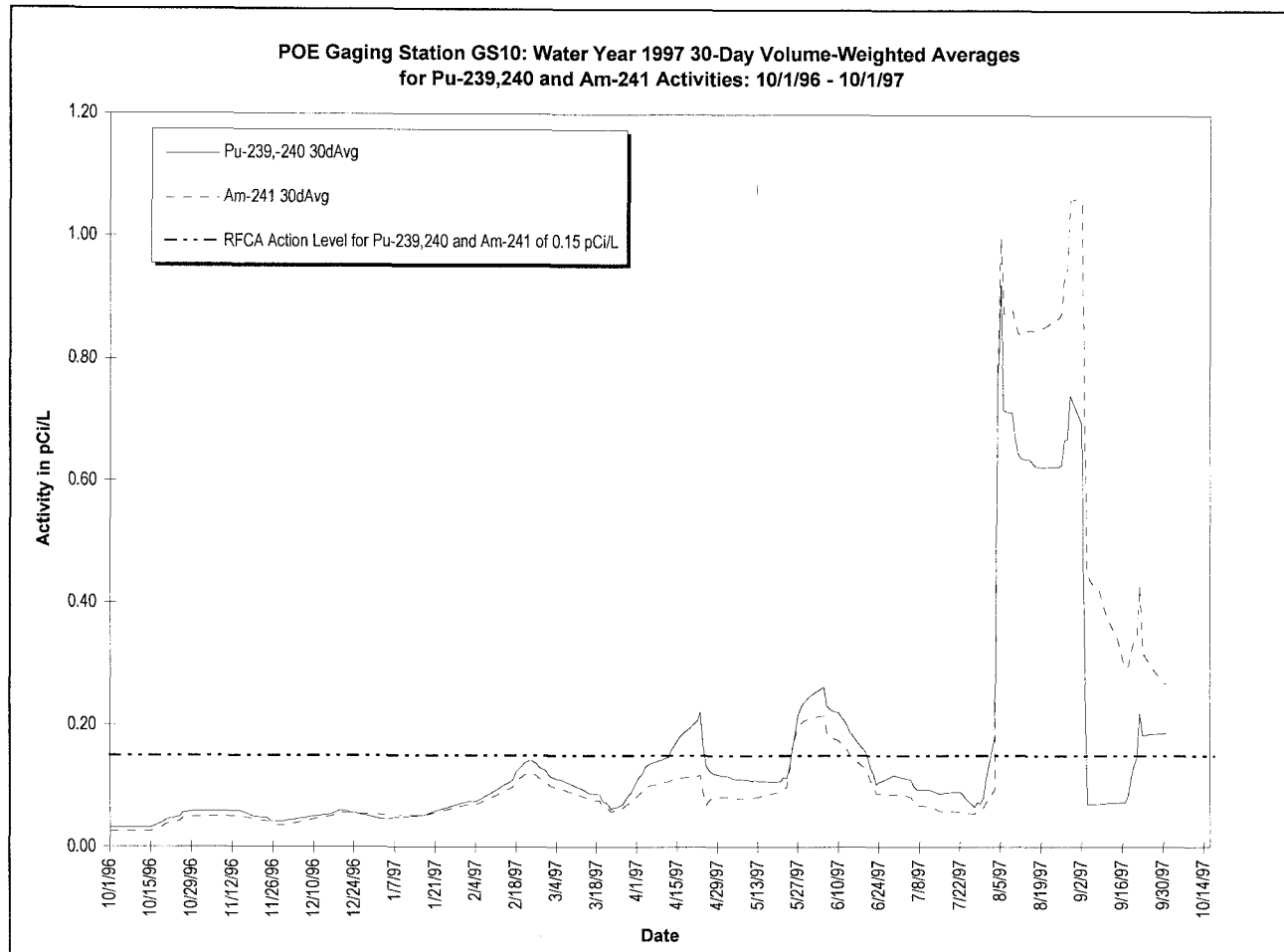
**Summary of Off-Normal Results at RFCA Point of Compliance, GS03
(Walnut Creek And Indiana Street)**

Date of Sample Composite (Begin-End)	Pu 239,240		Am 241		Pu 239,240 (Rerun)		Comments
	Result and Error (pCi/L)	Sample Recovery Pu	Result and Error (pCi/L)	Sample Recovery Am	Rerun Result and Error (pCi/L)	Sample Recovery Pu (Rerun)	
4/11/97 - 4/15/97	0.22 +/- 0.045	68%	0.059 +/- 0.064	71%	Insufficient sample for rerun for Pu or Am	N/A	<ul style="list-style-type: none"> Last sample container during Pond A-4 discharge. Did not cause exceedance of RFCA standard (30-day average) of 0.15 pCi(Pu)/L. No elevated Pu from Pond A-4 discharge. No other identified point sources. Analytical results received 6/9/97. Low sample volume (0.8 L) Data validated by APO → VALID
5/15/97 - 6/25/97	0.465 +/- 0.129	77%	0.256 +/- 0.116	47%	Very low volume remained for rerun (34 mL). Confirmed activity -- no quantitative result.	59%	<ul style="list-style-type: none"> Base flow. (No Pond A-4 discharge. No other identified point sources.) Initiated exceedance of RFCA standard (30-day average) of 0.15 pCi(Pu)/L at POC. Analytical results received 8/14/97. Low sample volume (0.4 L) Rerun confirmed activity, but yielded no value. Data validated by APO → VALID
6/25/97 - 6/27/97	0.206 +/- 0.046	77%	0.018 +/- 0.021	Aliquot #1 failed QA/QC for low recovery <20% Aliquot #2 = 47%.	0.124 +/- 0.057	73%	<ul style="list-style-type: none"> First (of 3) sample container during Pond A-4 discharge Continuing exceedance of RFCA standard (30-day average) of 0.15 pCi(Pu)/L at POC. No elevated Pu from Pond A-4 discharge. No other identified point sources. Analytical results received 8/14/97. Data validated by APO → VALID
6/27/97 - 7/1/97	0.184 +/- 0.046	70%	0.056 +/- 0.036	39%	Rerun failed for Pu (Lab failed to add tracer)	N/A	<ul style="list-style-type: none"> Second (of 3) sample container during Pond A-4 discharge Continuing exceedance of RFCA standard (30-day average) of 0.15 pCi(Pu)/L at POC. No elevated Pu from Pond A-4 discharge. No other identified point sources. Rerun failed; lab did not add tracer Analytical results received 8/14/97. Data validated by APO → VALID

Mean Daily Flow at Gaging Station GS03 with Individual Composite Sample Results
Shown at Midpoint of Sampling Period: 10/1/96 - 12/4/97

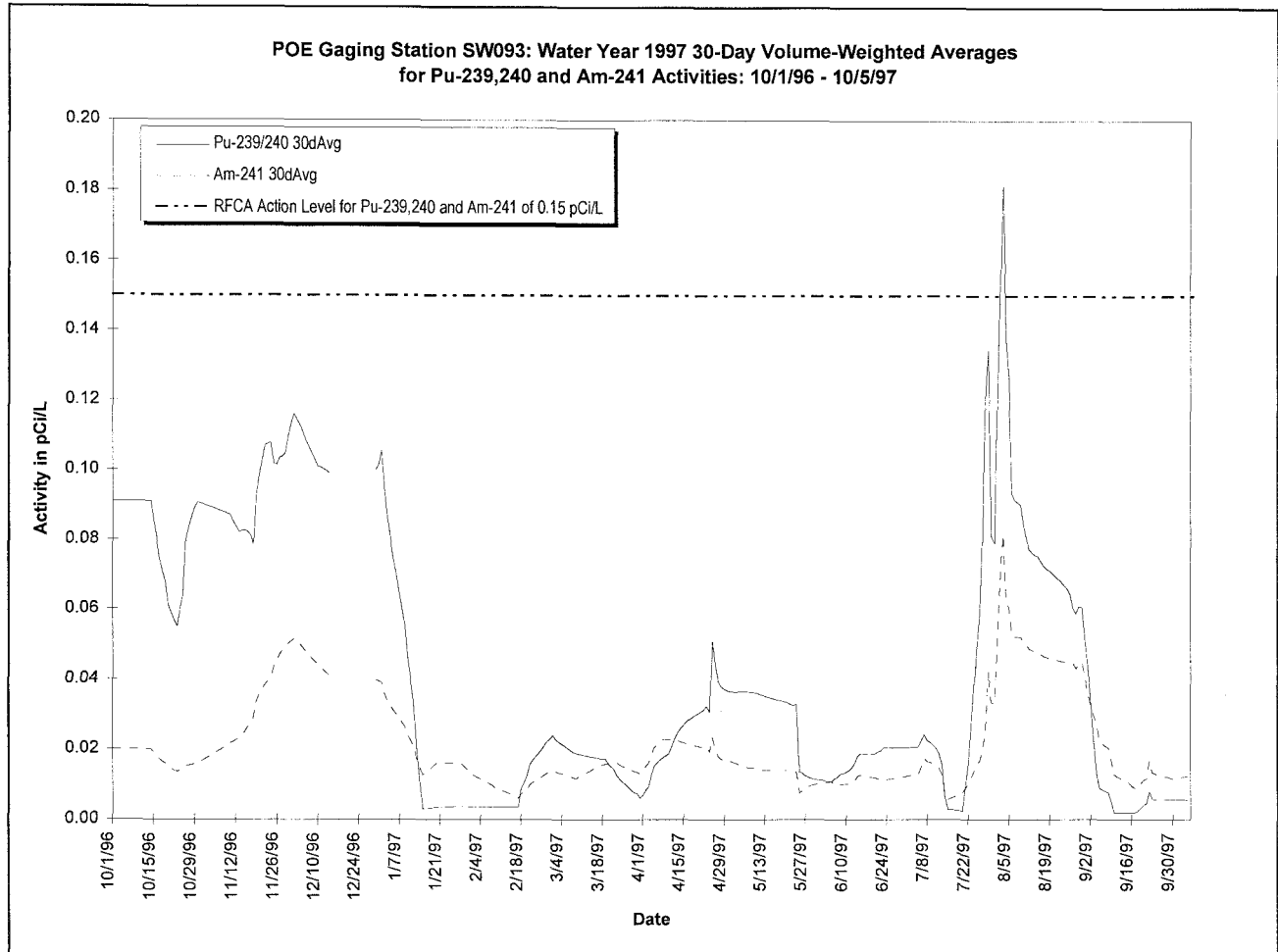


Point of Evaluation (GS10)



Gaging Station GS10 30-Day Averages: October 1, 1996 through October 1, 1997.

Point of Evaluation (SW093)



Gaging Station SW093 30-Day Averages: October 1, 1996 through October 5, 1997.

Path Forward

Final Source Evaluation Report due April 15, 1998

The *Final Source Evaluation Report and Mitigating Action Plan* to be submitted on April 15, 1998 will include the final assessment of the source evaluation for GS03, GS10, and SW093. This Report will also include recommendations for any mitigating actions deemed appropriate and effective in improving water quality. If source evaluations prove inconclusive at that time, additional evaluation will be considered. Mitigation actions will be targeted and designed based on the results of the source evaluation actions.

The *Final Source Evaluation Report and Mitigating Action Plan* will include:

- Information and analysis detailing what is known about Walnut Creek exceedances and possible sources.
- Conclusions of the source identification efforts to date (likely indicating no specific or localized source areas);
- Provide a commitment to understanding the cause(s) of the exceedance;
- Identification of data gaps and uncertainties in the source evaluation process with suggested modifications (if any) to the Actinide Migration Study Workscope and *Integrated Monitoring Plan*;
- A discussion of the complexity of the source identification and control issues;
- A detailed description of identified source areas; and possible mitigating actions applicable to each identified source area;
- Scope, schedule, and budget for any recommended mitigating actions;
- Solicit Stakeholder involvement in developing a path forward;
- Recommendation to convene a Stakeholder working group to reach consensus on mitigating actions; and
- Recommendation to submit considered mitigating actions to the RFCA/ER projects ranking or prioritization process.

Possible Control Option

Water-Quality Basin for Walnut Creek at Indiana Street

Design Basis:

- DOE Order 6430.1C
 - 25-year, 6-hour storm event (3.0 inches)
 - 1400 cfs peak; 183 ac-ft volume
- Designed for Contaminant Removal
 - flow through operation
 - inlet/outlet controls
 - basin geometry
- Issue: Possible Conflict with McKay Ditch Extension

Options:

- (1) Manage 25-year, 6-hour Storm Event
 - average pool depth 10-14 feet; max. 24 feet
 - approximately 18 acres
 - 170-190 acre-feet
- (2) Manage 5-year, 6-hour Storm Event
 - average pool depth 6-10 feet; max. 12 feet
 - approximately 9 acres
 - 70-80 acre-feet
- Cost \$ 10M - \$ 15M

Preliminary Conceptual Design for Walnut Creek Water Quality Basin

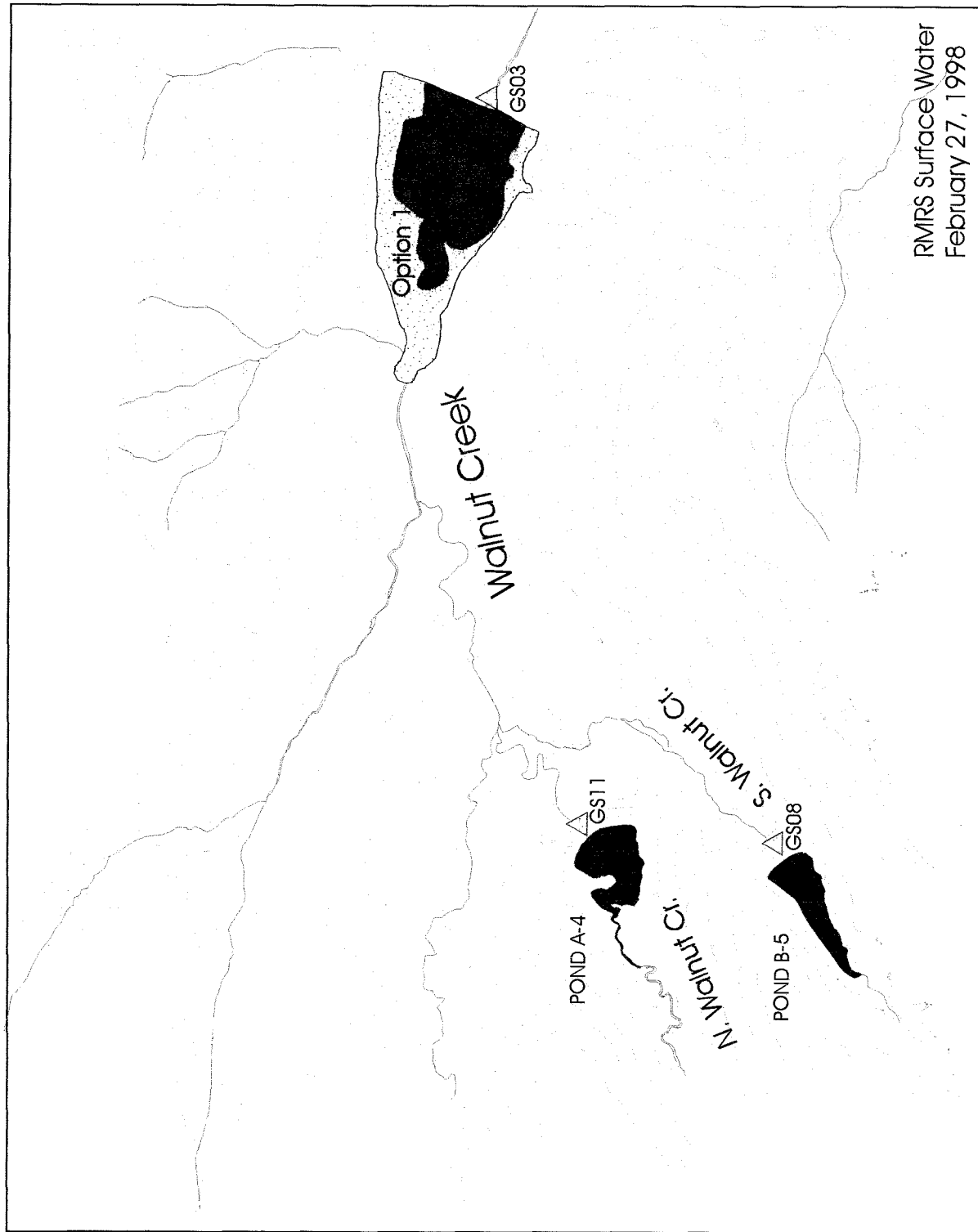


Figure 2-1

Selected Surface Water
Monitoring Locations

Legend

Gaging & Sampling

- ▲ Surface Water Monitoring Location

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCE:
Buildings, fences, hydrography, roads and other
features shown on this map were derived from
aerial photography taken in 1995.
Digitized from the orthophotograph, 1995

Scale = 1:11810
1 inch represents approximately 968 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site



Rocky Mountain
Remediation Services, L.L.C.
Geospatial Information Systems Group
Rocky Flats Environmental Technology Site
Golden, CO 80402-2404

MAP ID: 97-0198-Q509

September 11, 1997



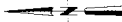


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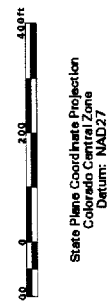
Figure 4-1
Selected Surface Water
Monitoring Locations
Tributary to GS10

- EXPLANATION**
- Drainage**
- GS10 Drainage
- Gaging & Sampling Stations**
- Point of Evaluation
 - Performance Monitoring
 - New Source Detection
- Standard Map Features**
- Buildings and other structures
 - Solar evaporation ponds
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences and other barriers
 - Contour (20-Foot)
 - Paved roads
 - Dirt roads

DATA SOURCE:
Buildings, fences, topography, roads, and other features were obtained from aerial photography acquired by ES&S GIS, Las Vegas, 1996. Topography was obtained from the National Elevation Dataset (NED) by the U.S. Geological Survey. The DEM data were courtesy of the Remote Sensing Lab, Los Alamos National Laboratory. The DEM data were processed by MTC, Winter 1997.



Scale = 1" = 4250'
1 inch represents approximately 353 feet



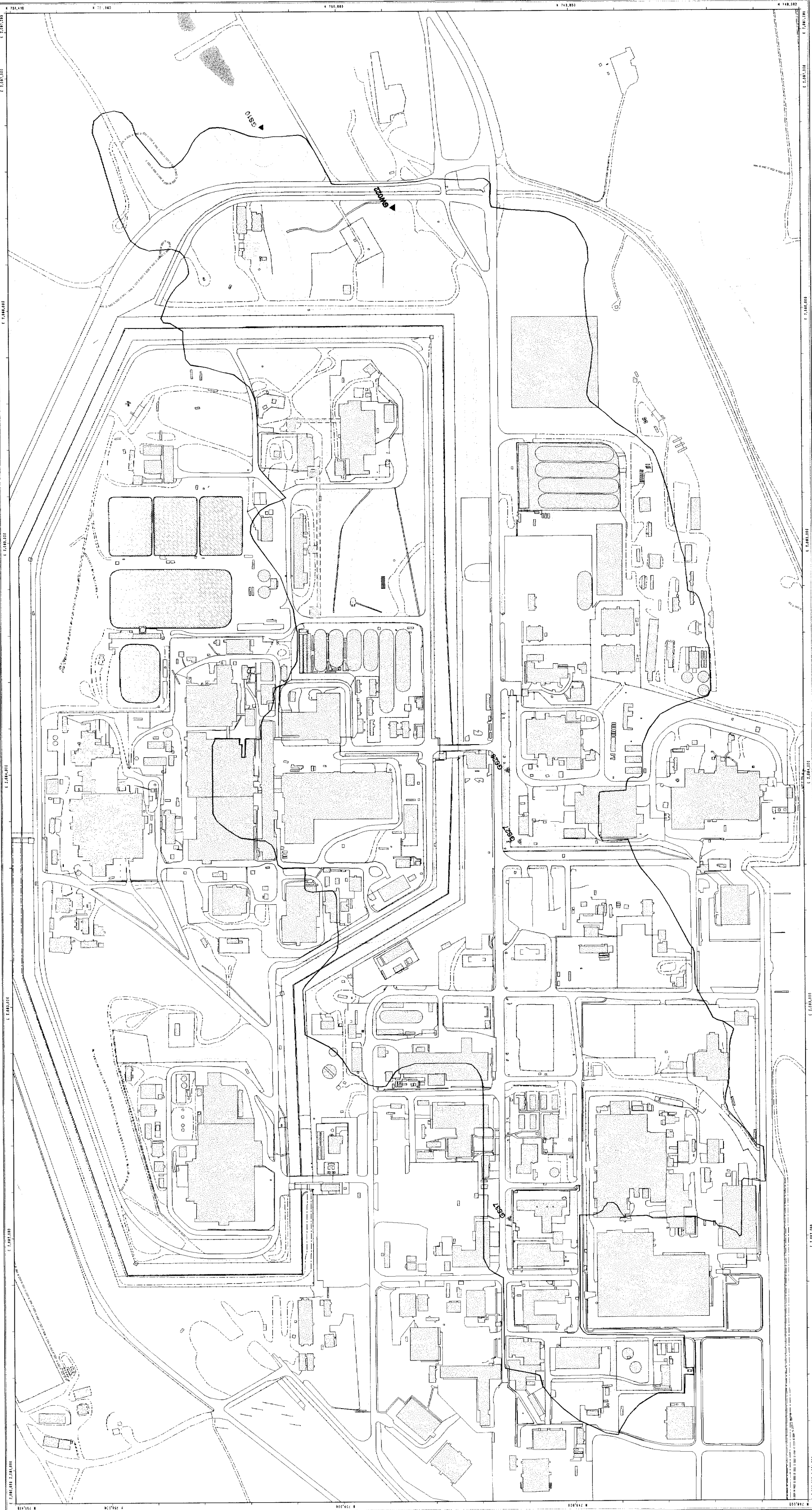
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

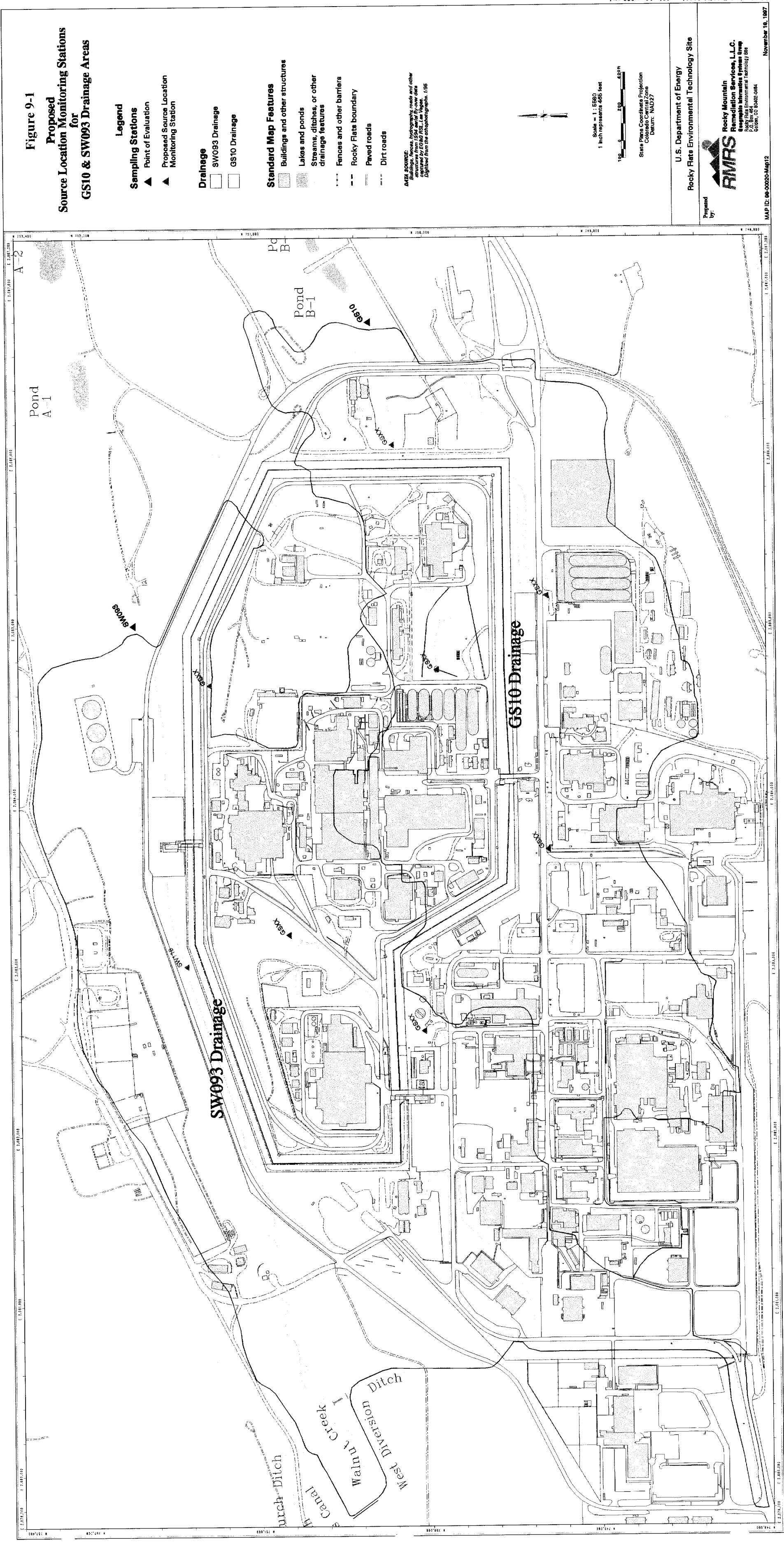
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MAP ID: 98-0020-Map5
November 13, 1997



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